

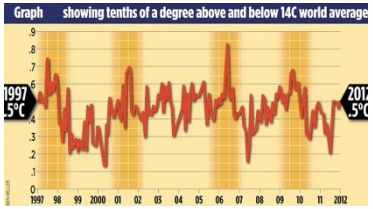

Séminaire interne 2

Le phénomène El Niño




Charles Adrien LOUIS

Sommaire



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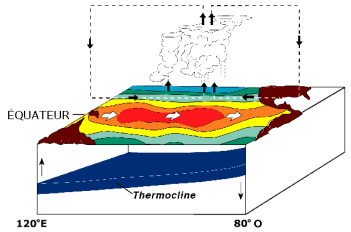

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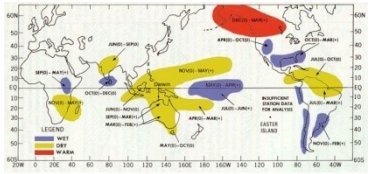
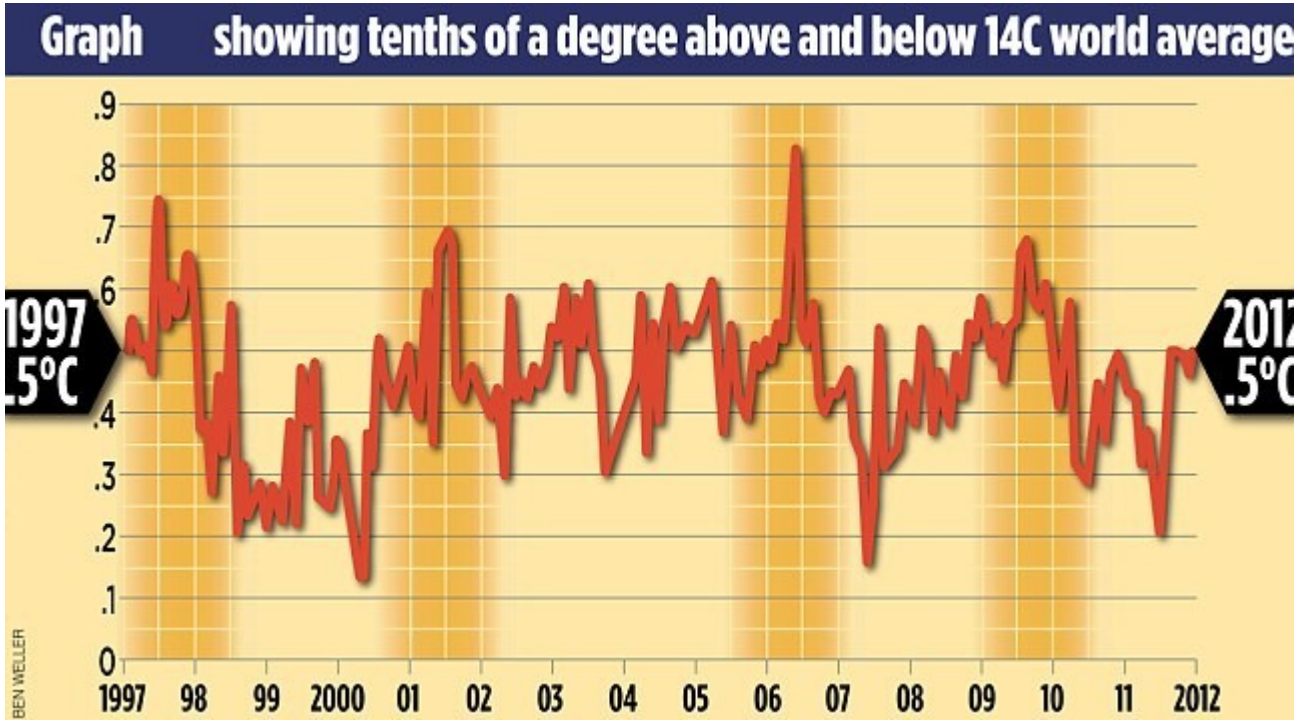


Fig.16 Schematic representation of typical ENSO-related precipitation anomalies over the globe. Red encloses relatively warm regions and blue encloses relatively wet regions. The approximate period of extreme conditions relative to the typical El Nino year (0) is also shown (adapted from Peixoto 1993)

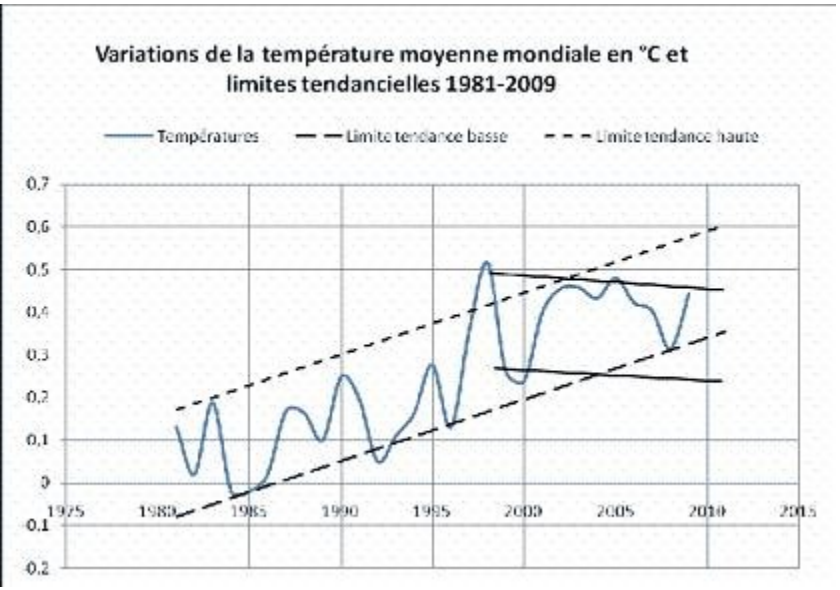
3. Des répercussions mondiales

Le réchauffement a disparu ?

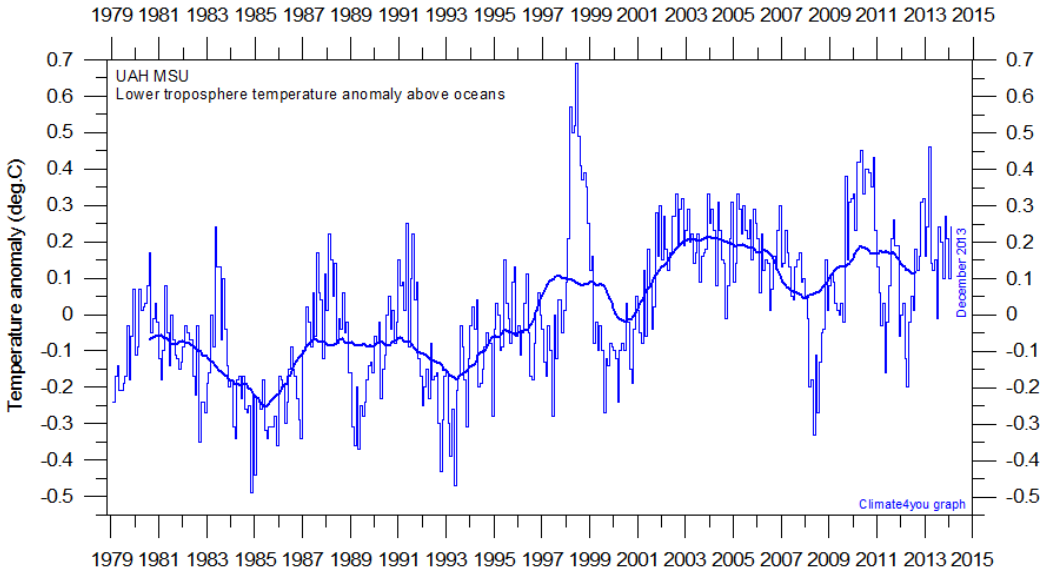


http://www.contrepoints.org

Détachons nous un peu, mais restons sceptiques

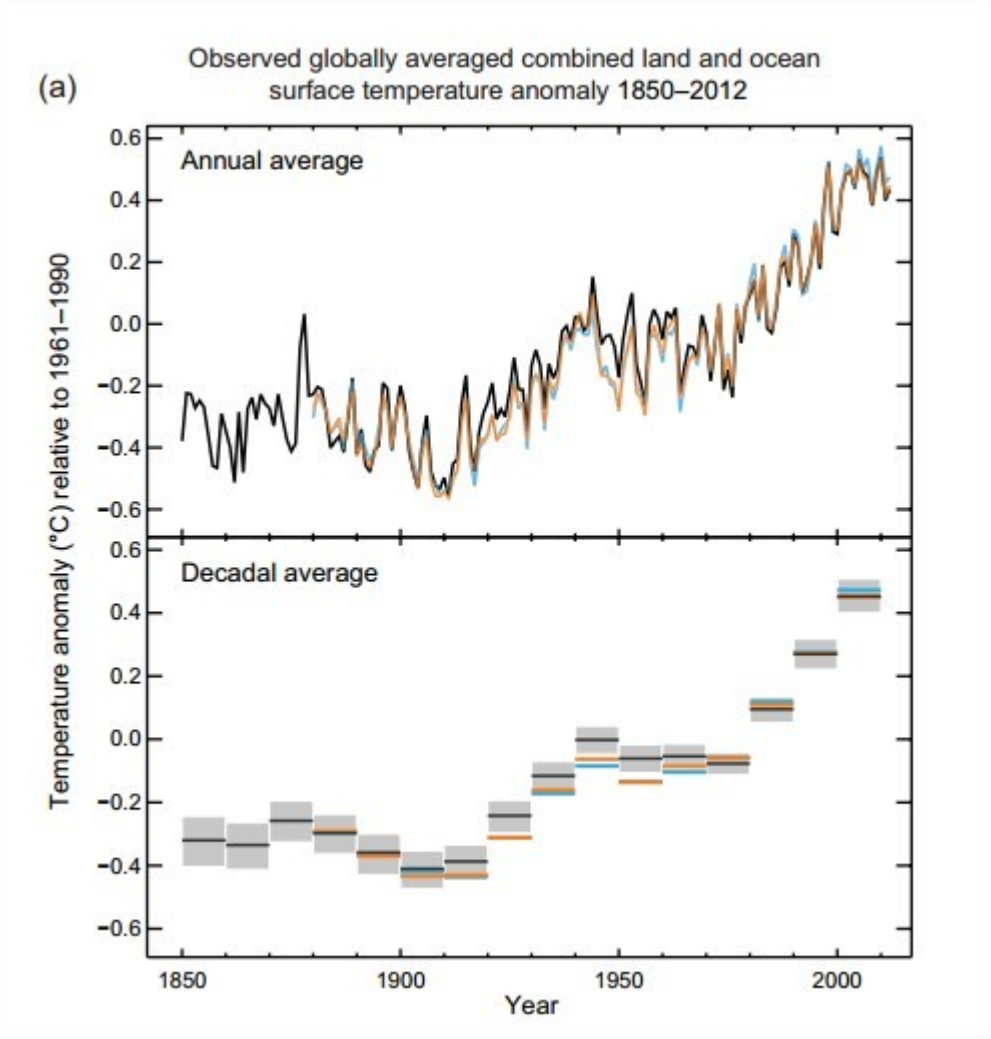


http://blog.turgot.org/index.php?post/Garrigues-Temp%C3%A9ratures



http://climate4you.com/images/MSU%20UAH%20SST%20GlobalMonthlyTempSince1979%20With37monthRunningAverage.gif

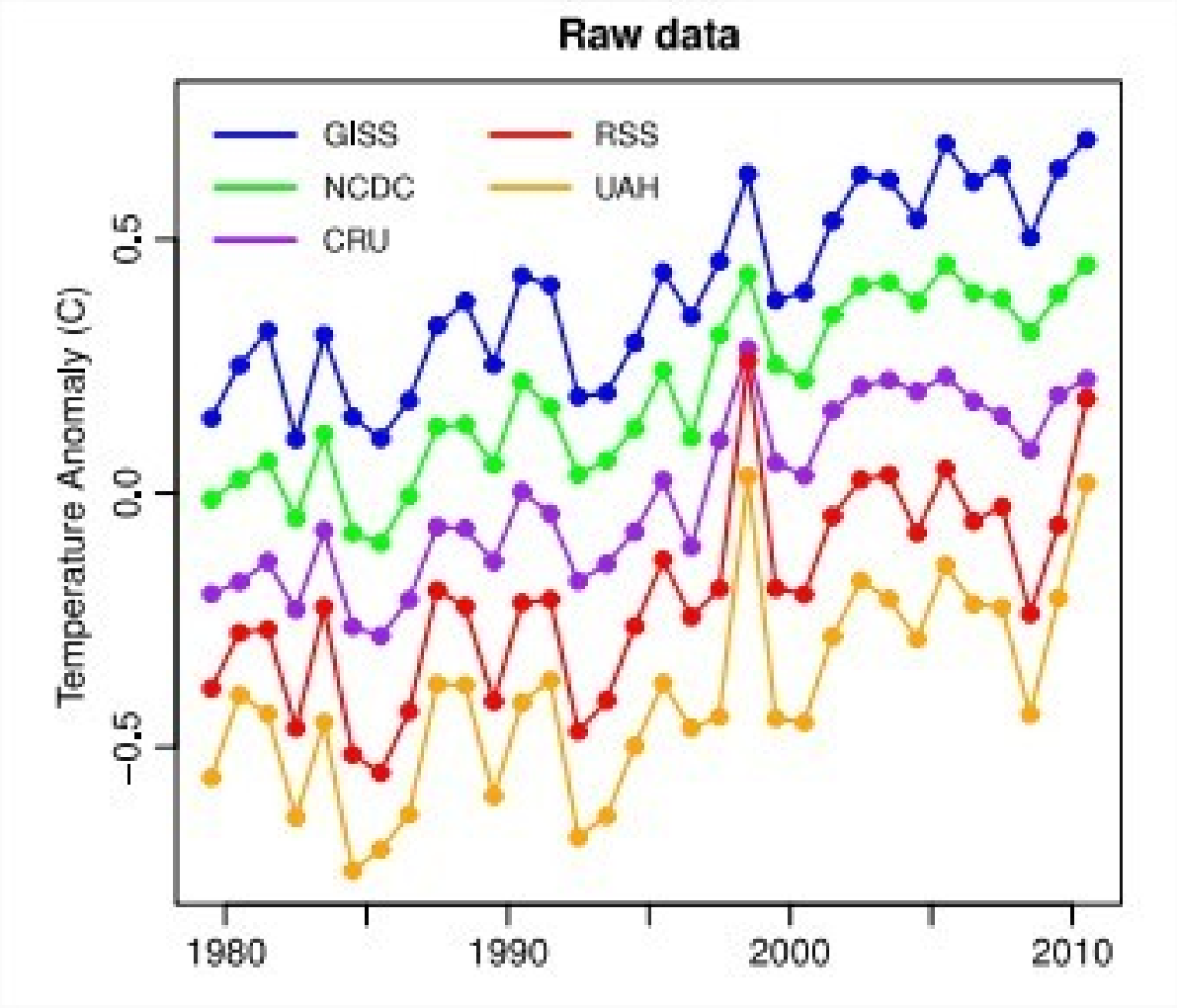
Il en dit quoi le GIEC ??



GIEC Rapport 5 Sumary for policymakers

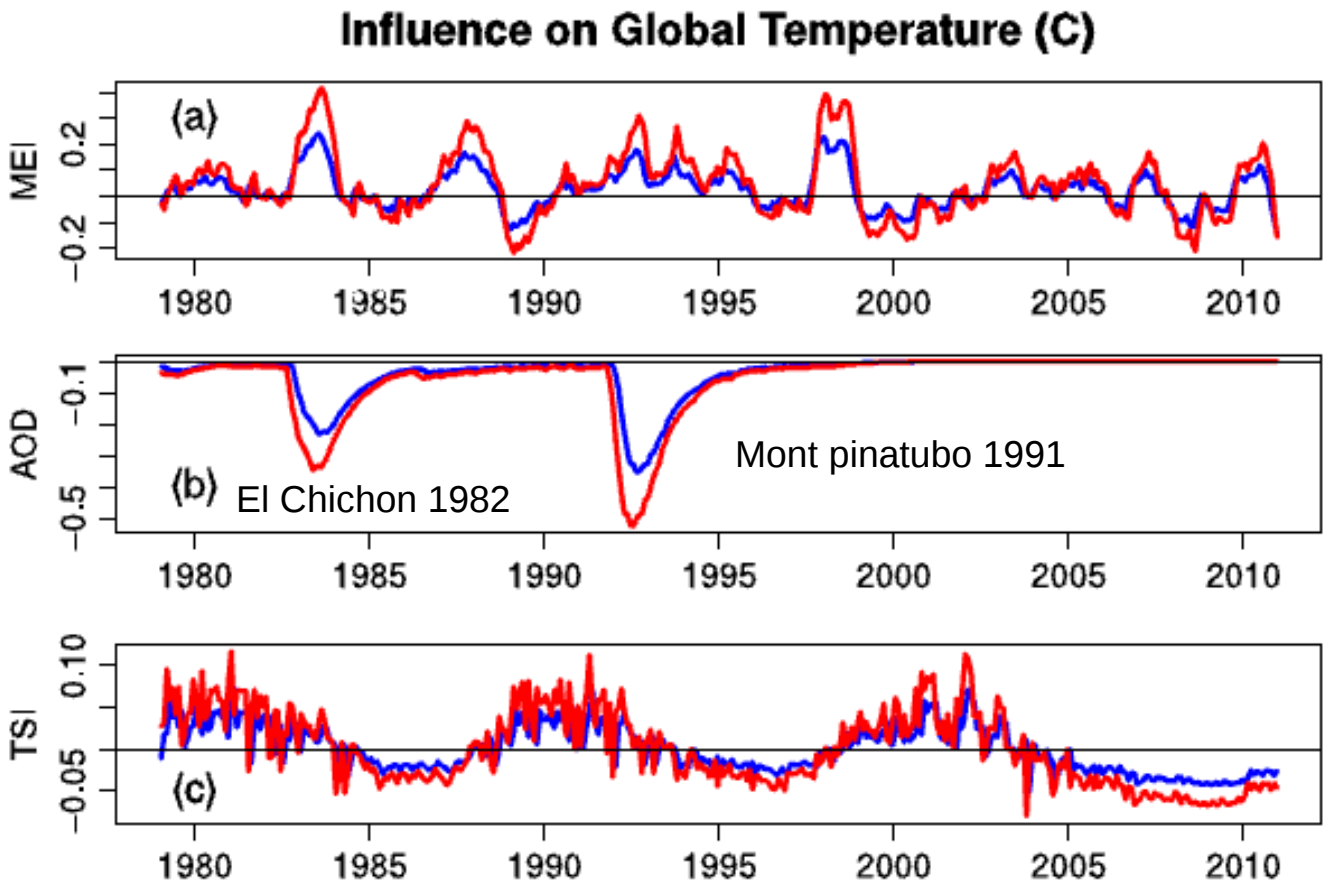
(El Niño : 238 fois cité dans le rapport du Giec 2013 !!)

Ca stagne !



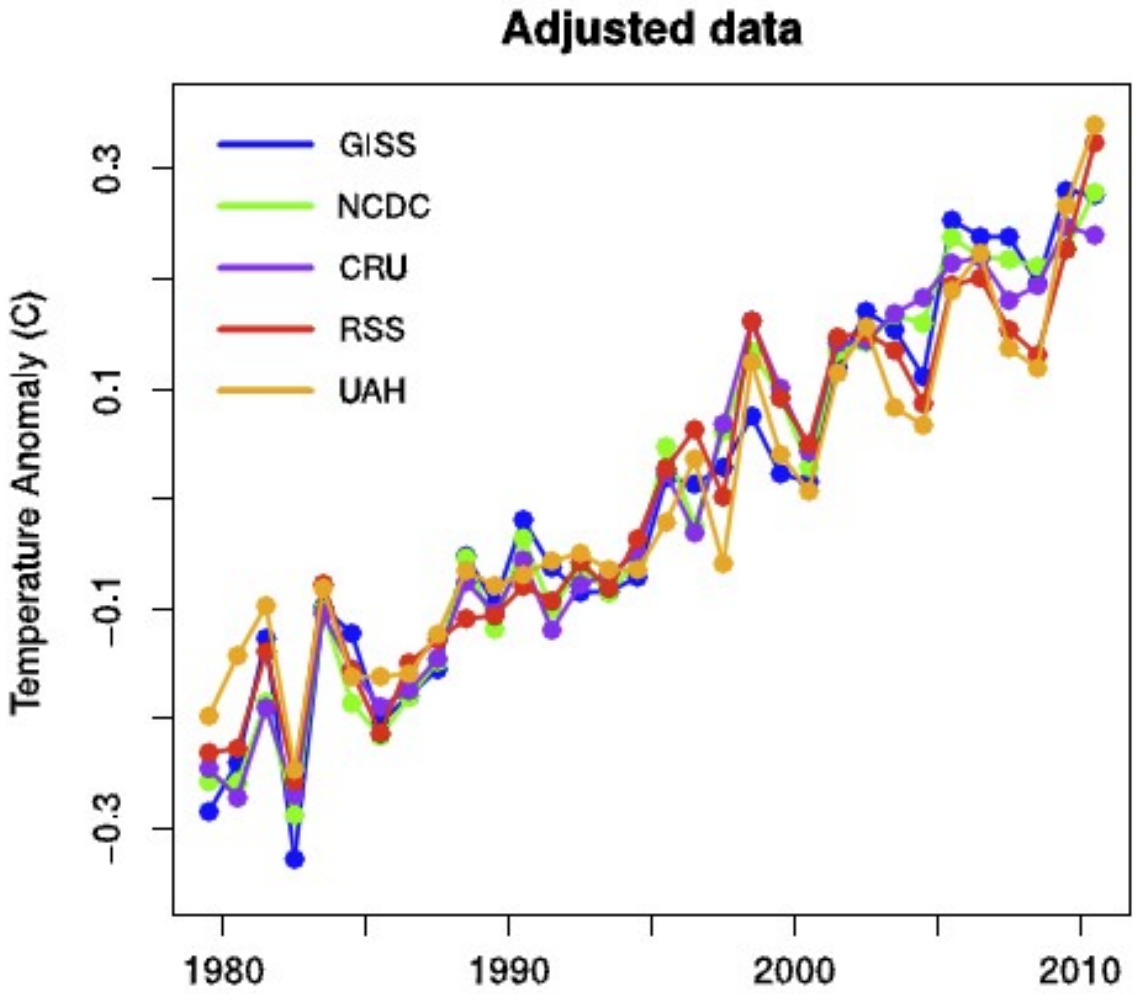
IOPScience.iop.org

L'Homme n'est pas tout seul à jouer avec le climat



http://23dd.fr/climat/les-climatosceptiques/23-les-temperatures-baissent-depu

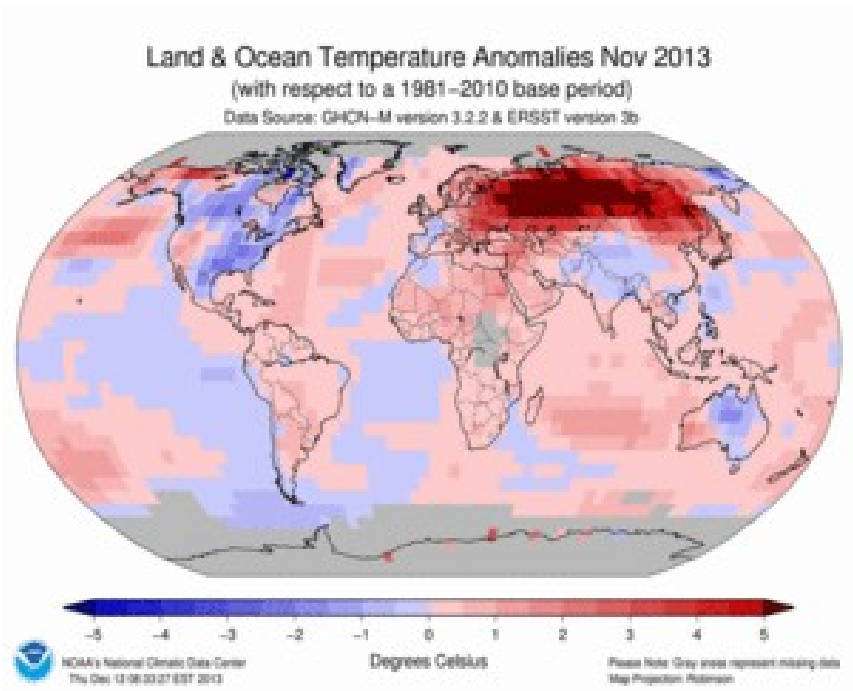
Si on retire l'influence des 3 facteurs précédents, ça donne quoi?

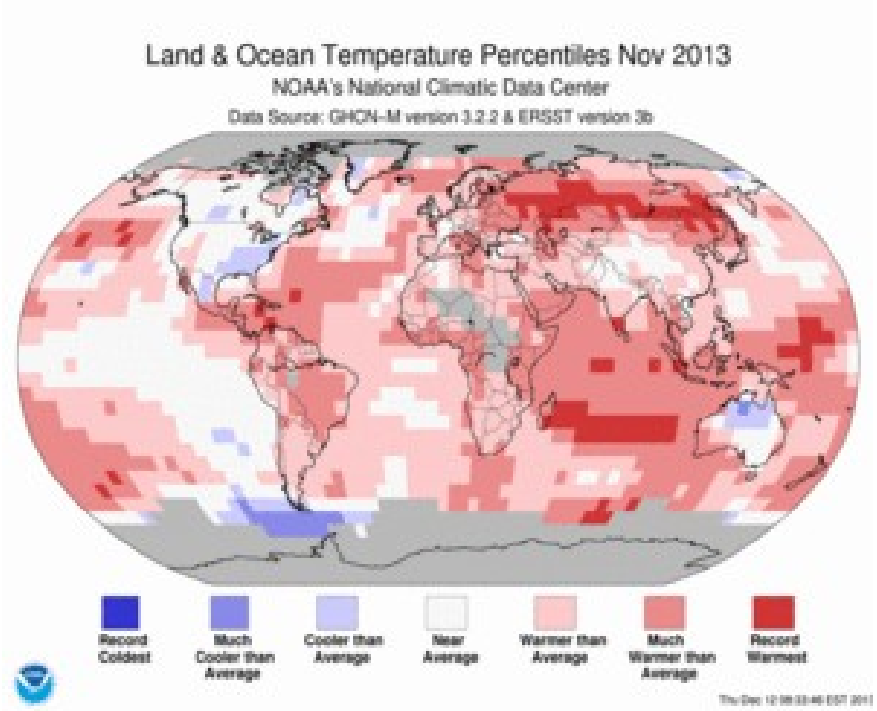


http://23dd.fr/climat/les-climatosceptiques/23-les-temperatures-baissent-depuis-1998-

Un mois bien chaud !

NOAA





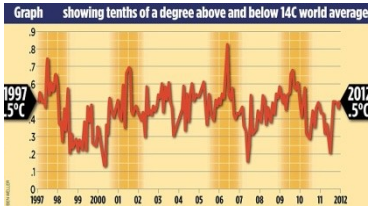
Un record même

The average temperature across global land and ocean surfaces during November 2013 was record highest for November in the 134-year period of record, at 0.78°C (1.40°F) above the 20th century average. This surpasses the previous record set in 2004 by 0.03°C (0.05°F) and is also the sixth highest monthly departure from average among all months on record and the highest since March 2010, one of the last months in which El Niño conditions were present in the eastern and central equatorial Pacific Ocean. During November, warmer-than-average temperatures across most of the world's ocean surfaces contributed to the anomalous warmth. Even with ENSO-neutral conditions holding for the 19th straight month, the November global ocean temperature tied with 2009 as the third highest for November, at 0.54°C (0.97°F) above the 20th century average

NOAA

November	Anomaly		Rank (out of 134 years)		Records		
	°C	°F			Year(s)	°C	°F
Global							
Land	+1.43 ± 0.11	+2.57 ± 0.20	Warmest	2nd	2010	+1.62	+2.92
			Coolest	133rd	1892	-0.95	-1.71
Ocean	+0.54 ± 0.04	+0.97 ± 0.07	Warmest	3rd	1997	+0.56	+1.01
			Coolest	132nd	1909	-0.49	-0.88
	Ties: 2009						
Land and Ocean	+0.78 ± 0.07	+1.40 ± 0.13	Warmest	1st	2013	+0.78	+1.40
			Coolest	134th	1907	-0.52	-0.94

Sommaire



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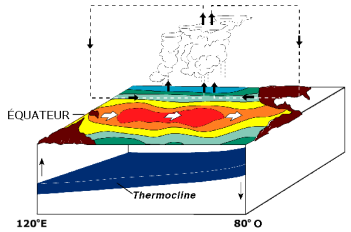

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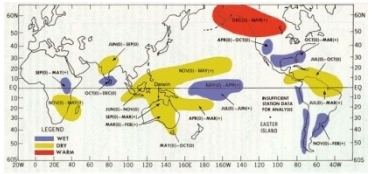
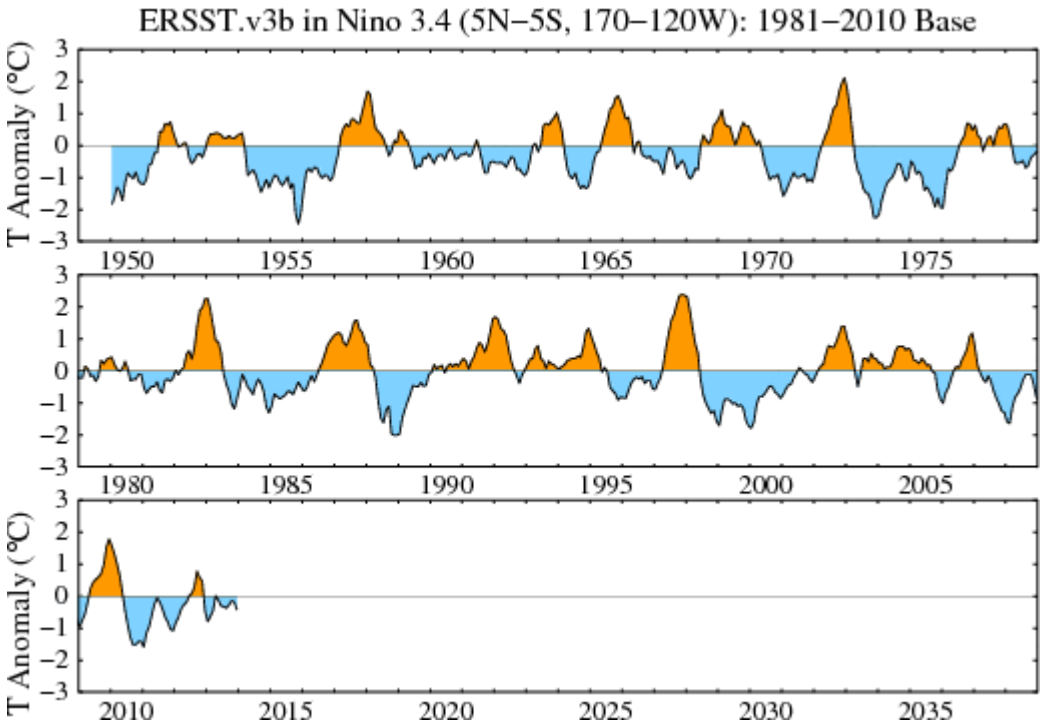


Fig.16 Schematic representation of typical ENSO-related precipitation anomalies over the globe. Red encloses relatively warm regions and blue encloses relatively wet regions. The approximate period of extreme conditions relative to the typical El Nino year (0) is also shown (adapted from Peixoto 1993)

3. Des répercussions mondiales

Le El... quoi???



NOAA Climate Prediction Center / Université de Columbia (USA) Source :
http://www.notre-planete.info/terre/climatologie_meteo/elnino.php

Les mouvements de l'océan

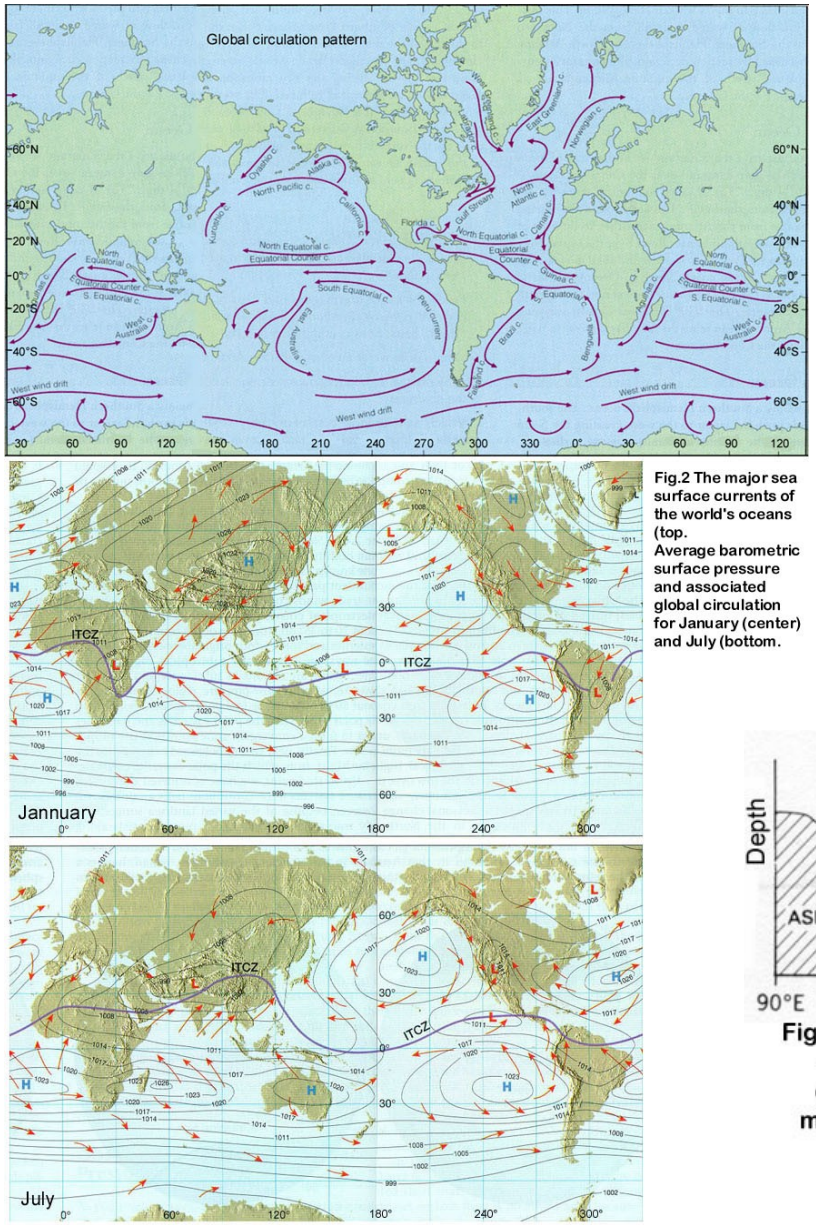


Fig.2 The major sea surface currents of the world's oceans (top. Average barometric surface pressure and associated global circulation for January (center) and July (bottom.

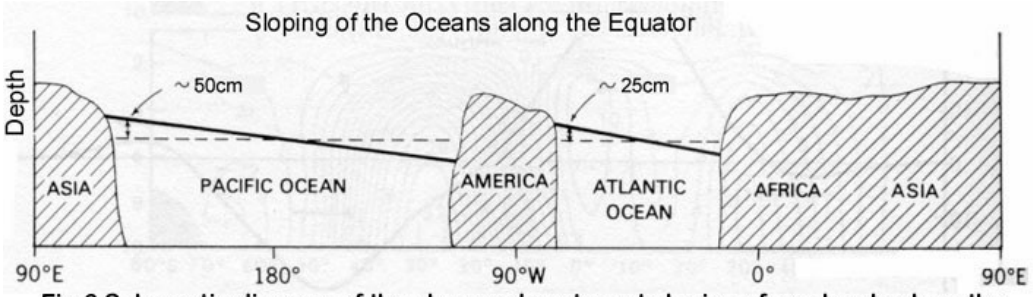


Fig.3 Schematic diagram of the observed east-west sloping of sea levels along the equatoric circle. The resulting pressure difference across the low-lattitude continents together with similar differences (but opposite in sign) across the midlatitude continents may lead to continental torques needed to satisfy global angular momentum constraints.

Un peu de Coriolis ?

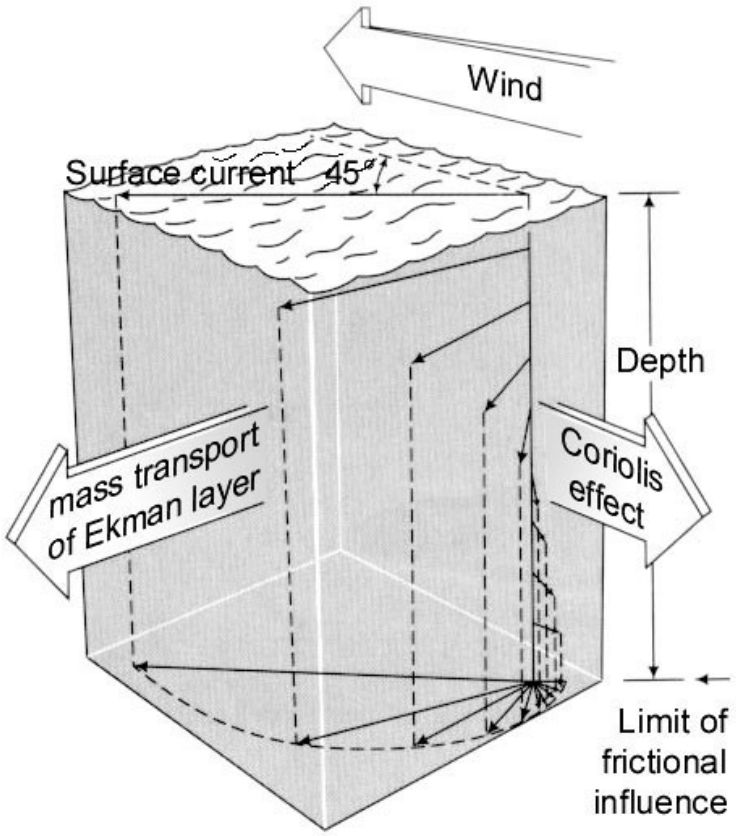


Fig.4 The Ekman spiral (southern hemisphere) is believed to be the result of the action of steady wind on surface waters.

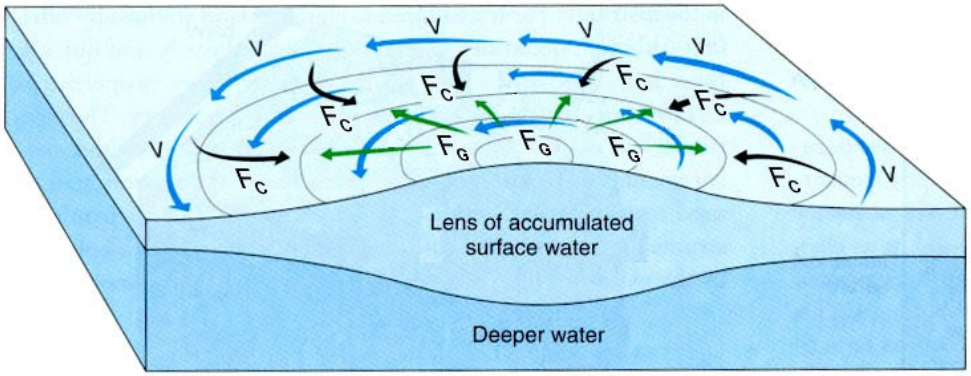


Fig.5 Currents flow (V) around a gyre when the inward Ekman transport due to the Coriolis effect (Fc) is balanced by Fg, the outward force due to gravity.

Le courant Péruvien

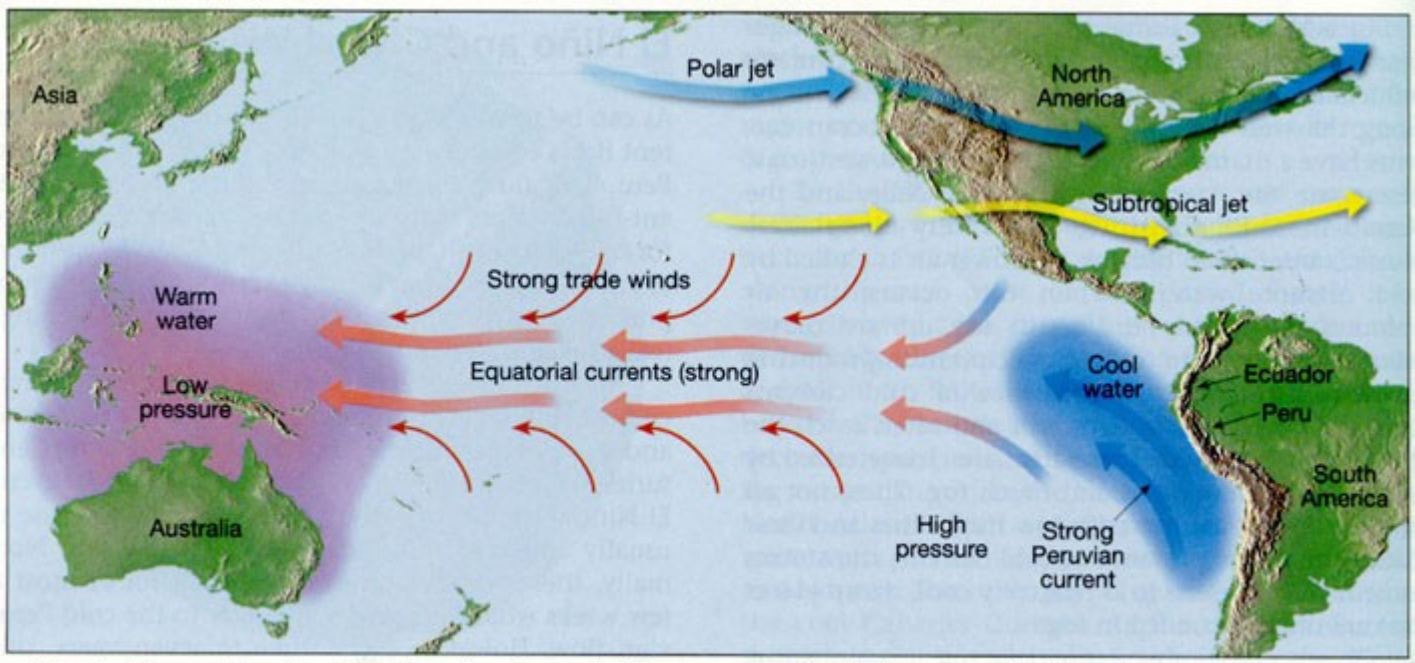


Fig.6 Normally, the trade winds and strong equatorial currents flow toward the west. At the same time, an intense Peruvian current causes upwelling of cold water along the west coast of South America.

Des hauts et des bas

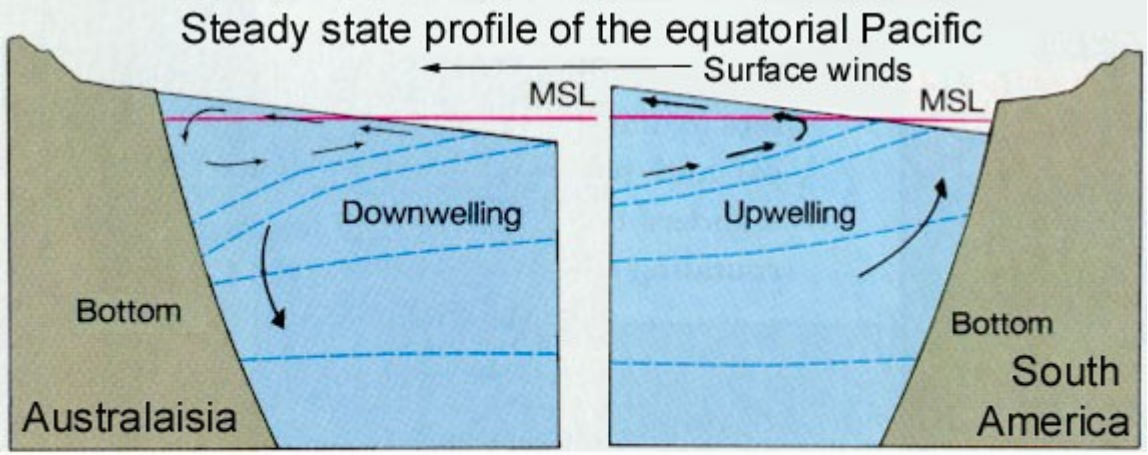
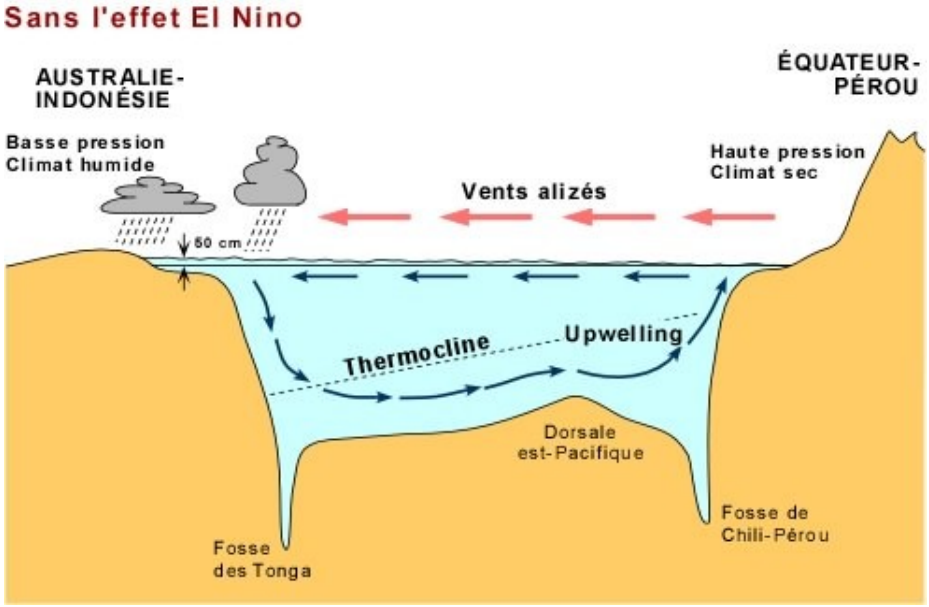
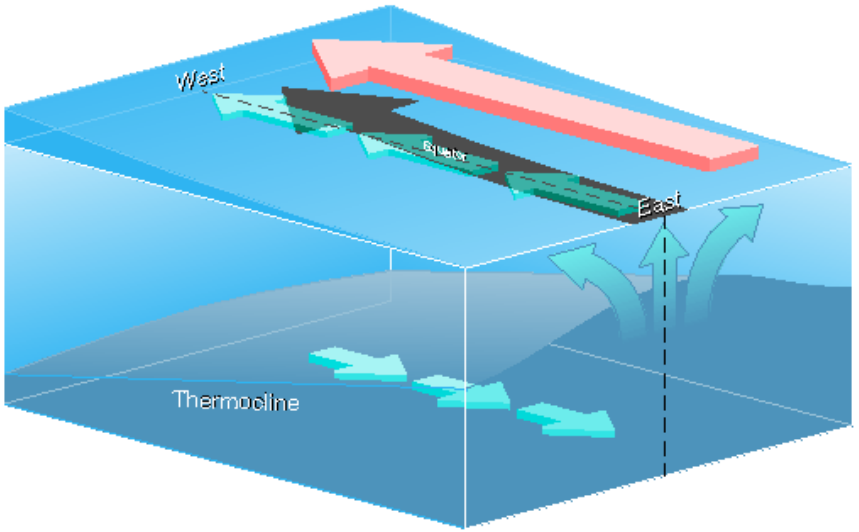


Fig7. For downwelling to occur (according to Ekman), a southbound wind must be present - this is the case at the east coast of Australia; while a northbound wind must blow at the west coast of South America for upwelling to take place.

Les habitudes régionales





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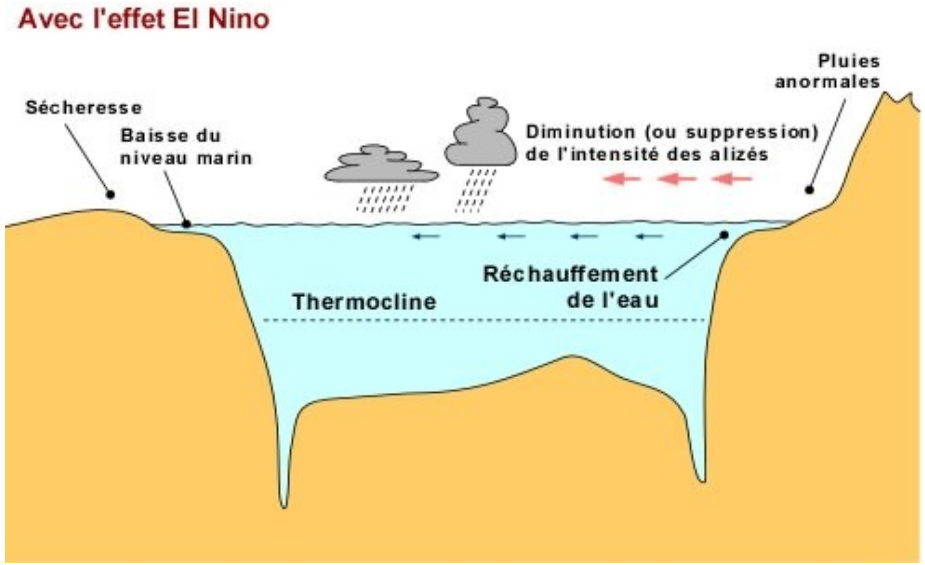
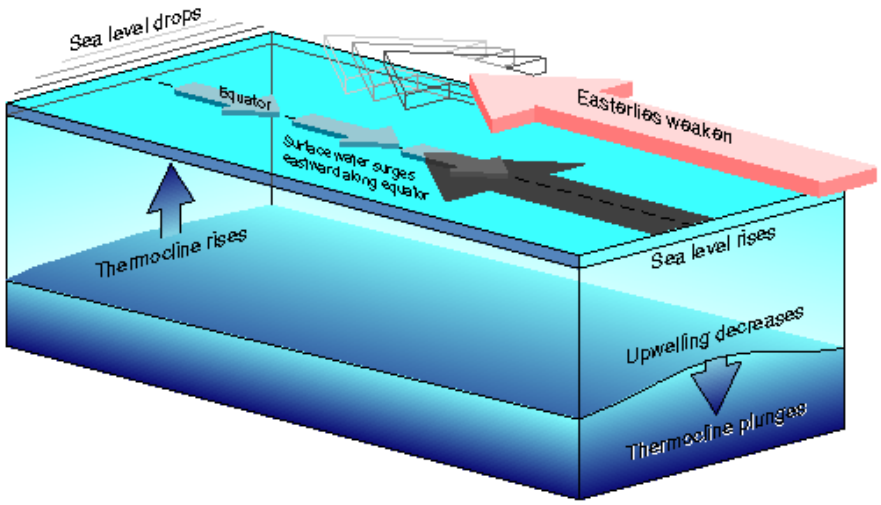
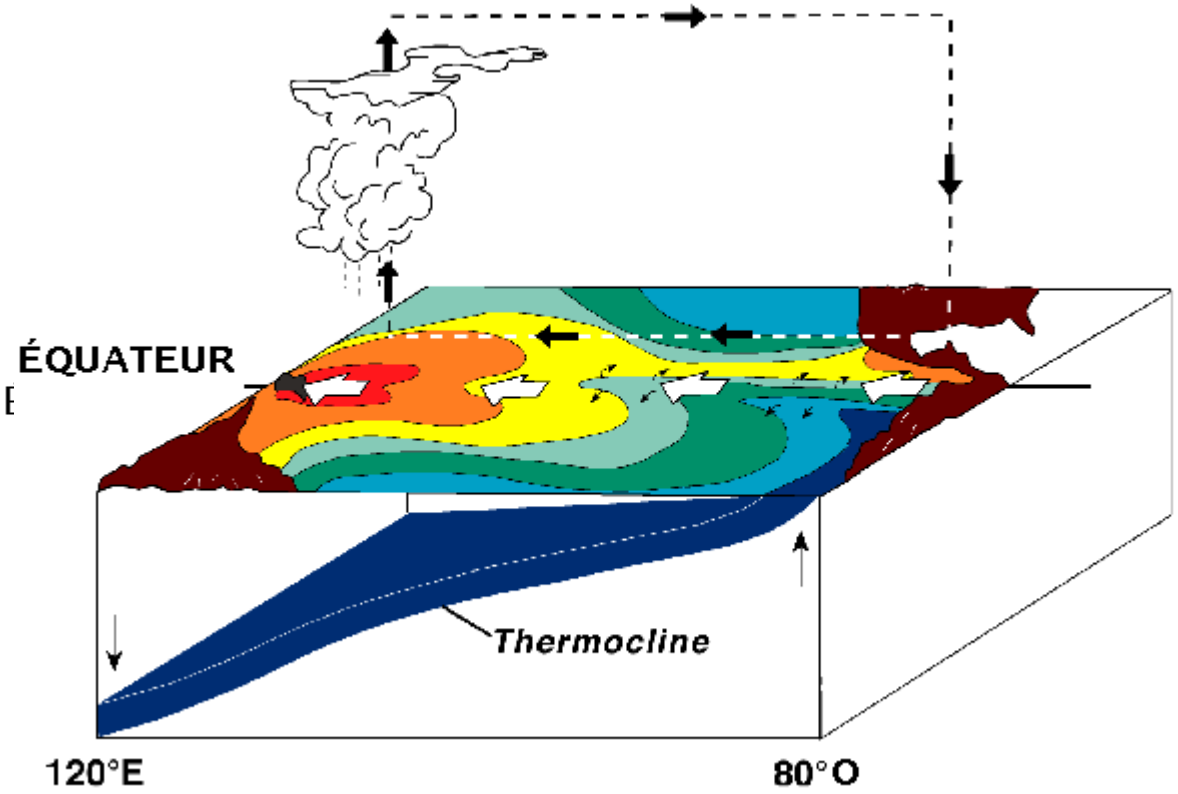
La perturbation du petit enfant





http://23dd.fr/climat/les-climatosceptiques/23-les-temperatures-baissent-depuis-1998-

La circulation de Walker



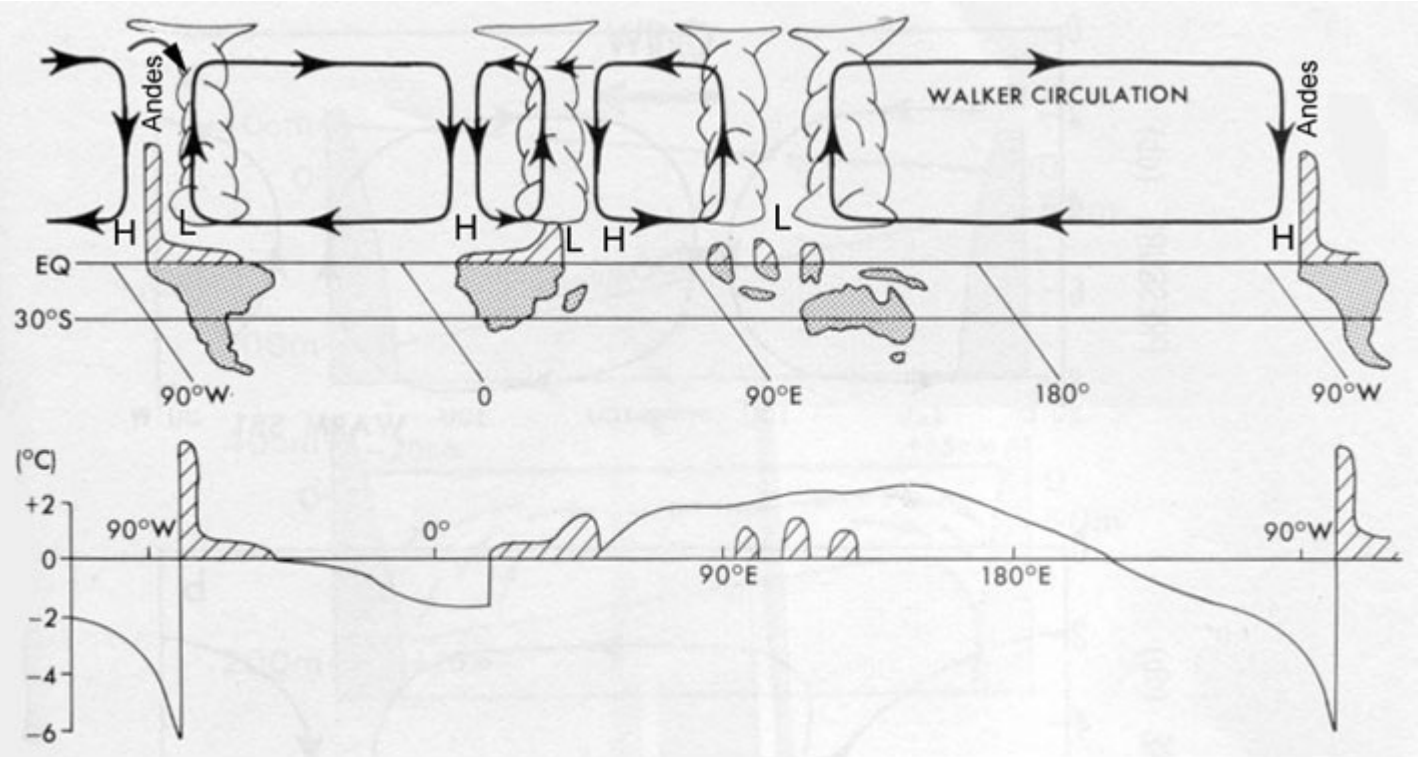


Fig.9 Schematic diagram of the normal Southern Oscillation along the equator during non-ENSO-conditions. Rising air and heavy rains tend to occur over Indonesia and the western Pacific, southeast Africa, and Amazonia, while sinking air and desert conditions prevail over the eastern equatorial Pacific and southwest Africa.

En route pour le Pérou !

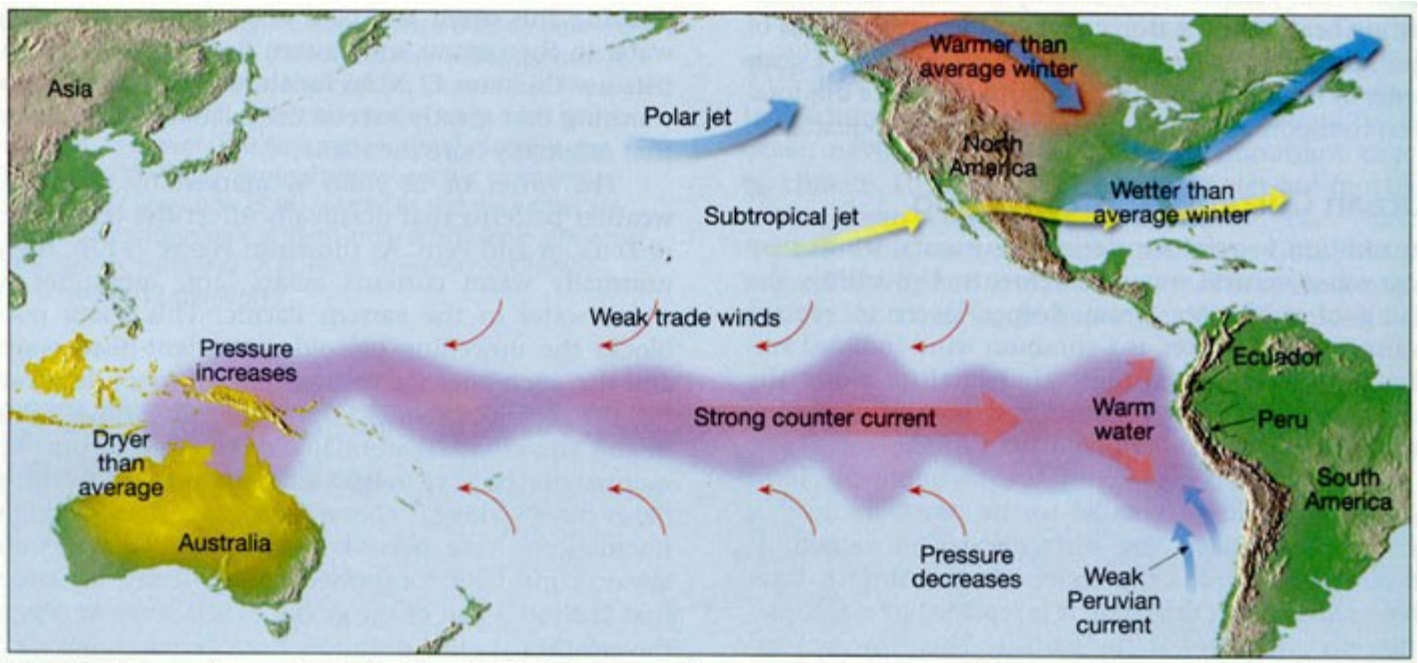
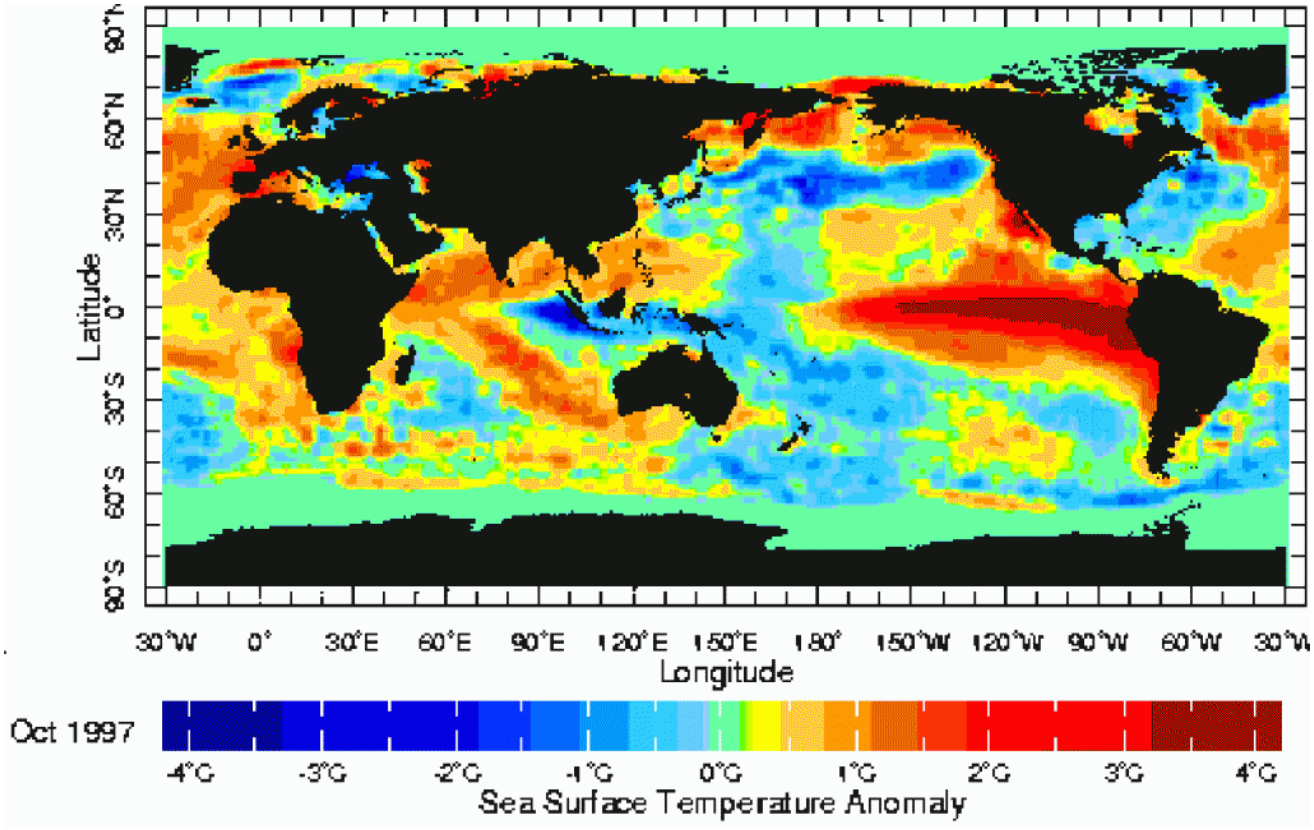


Fig.14 Upon the advent of an ENSO event, the pressure over the eastern and western Pacific flip-flops. This causes the trade winds to diminish, leading to an eastward movement of warm water along the equator. As a result, the surface waters of the central and eastern Pacific warm, with far-reaching consequences to weather patterns.

Le big niño de 1998…



Suivi de près par la big niña

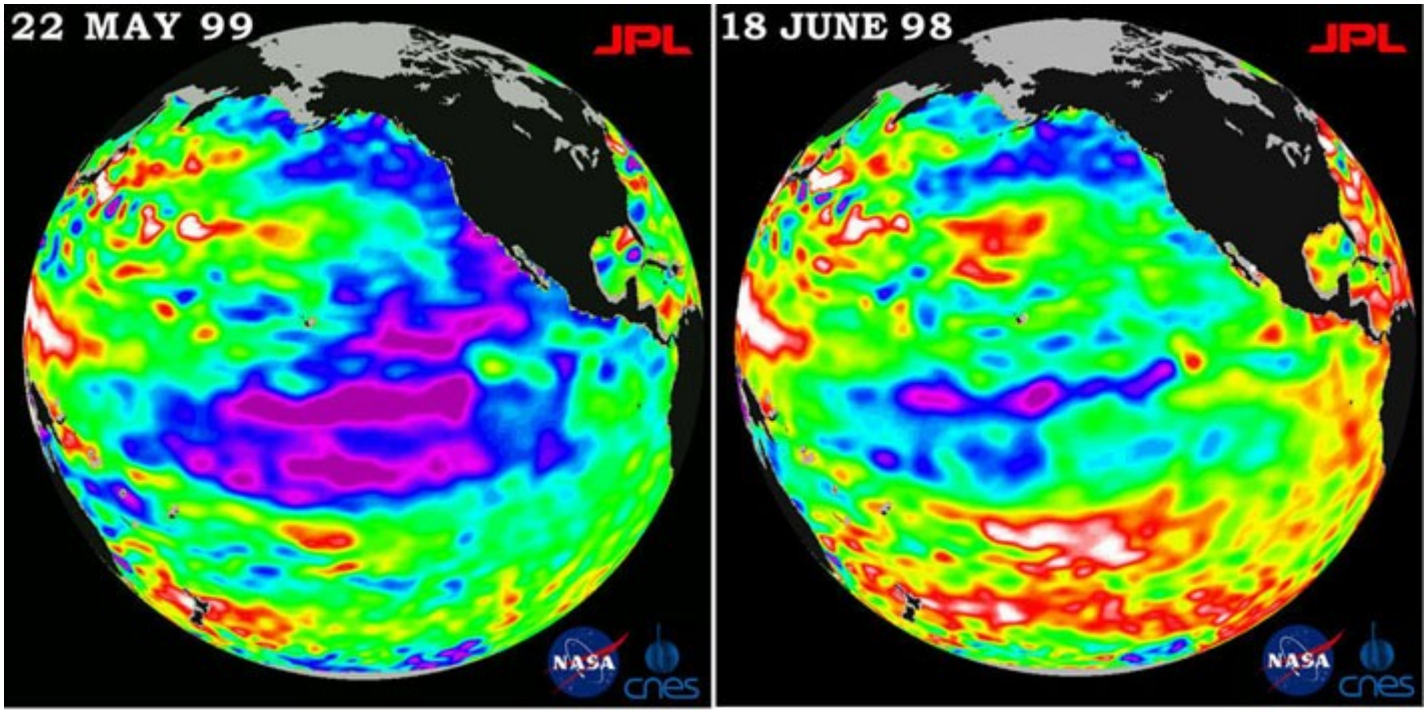


Fig.13 A very strong La Nina is pictured on the left; a weak La Nina event can be seen on the right

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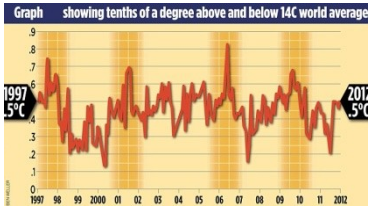

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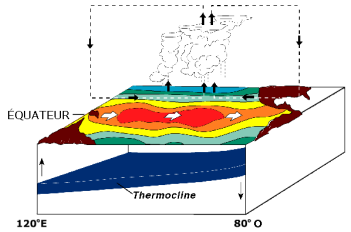

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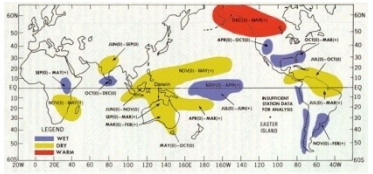
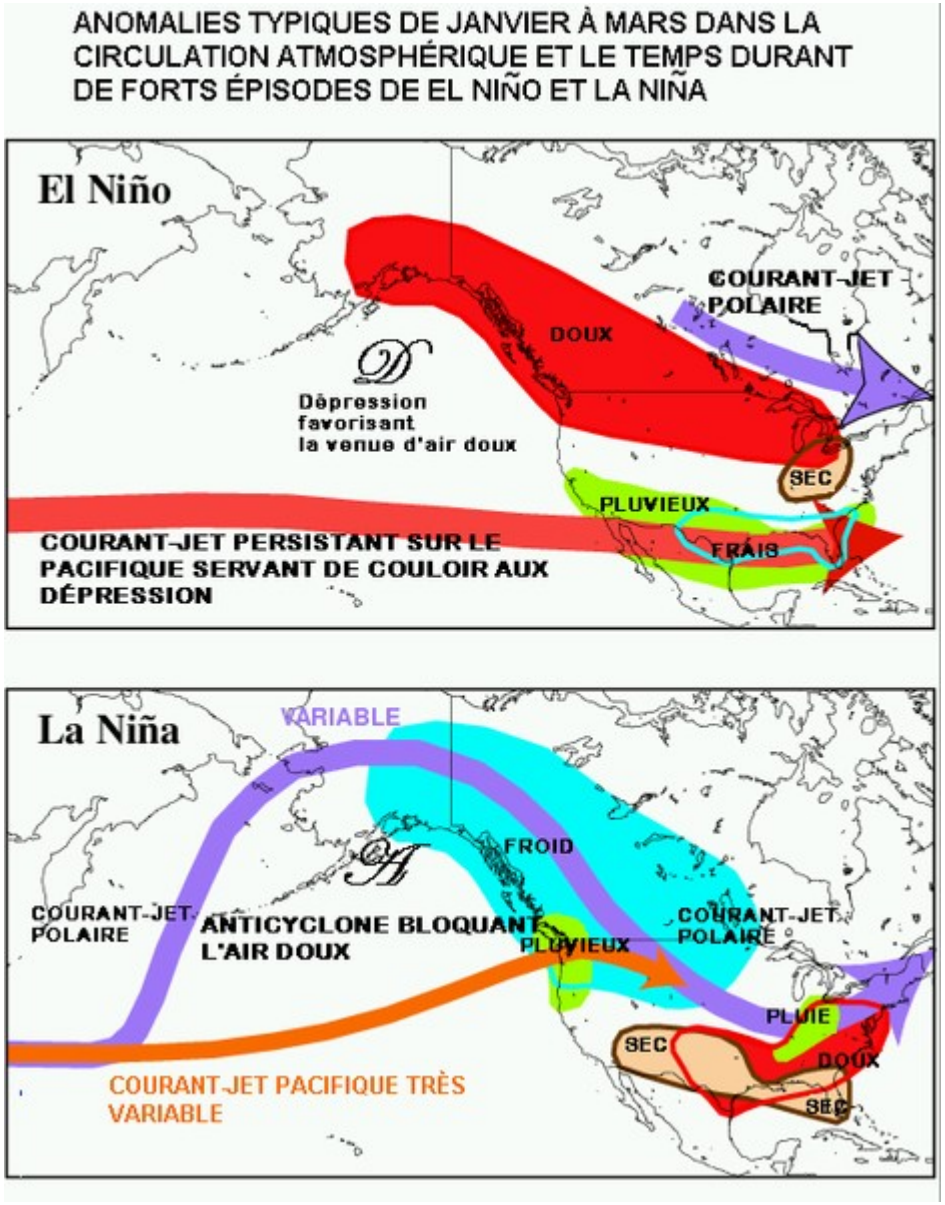


Fig.16 Schematic representation of typical ENSO-related precipitation anomalies over the globe. Red encloses relatively warm regions and blue encloses relatively wet regions. The approximate period of extreme conditions relative to the typical El Nino year (0) is also shown (adapted from Peixoto 1993)

3. Des répercussions mondiales

Les effets au Nord



Les effets d'El Niño 1983 : l'événement du siècle !!

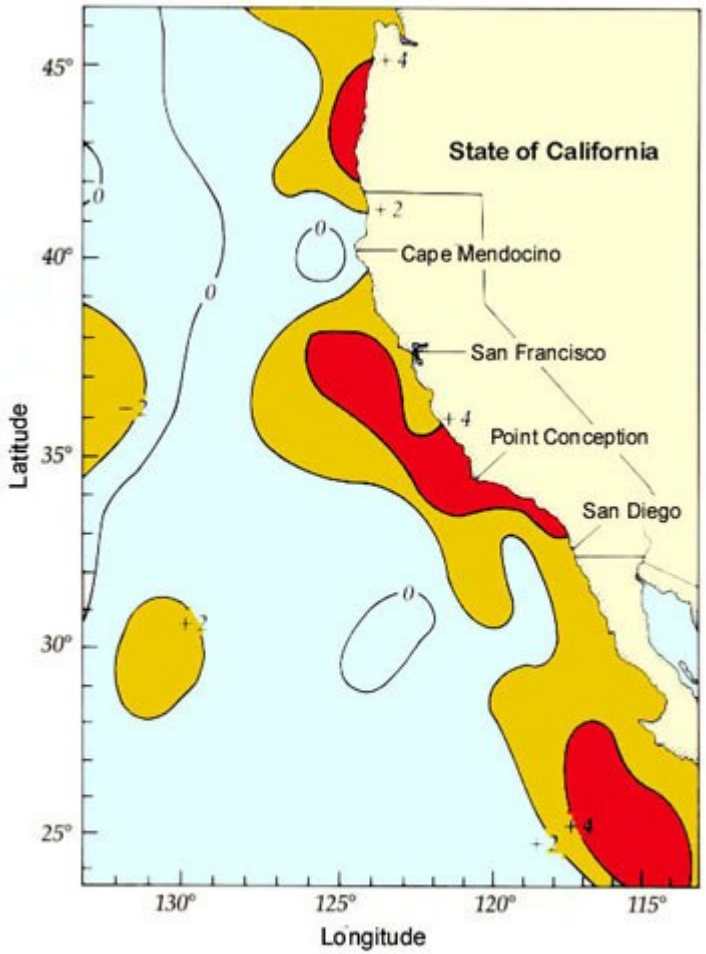


Fig.18 Sea surface temperature anomalies along the California coast during the El Nino effect of 1983. (window between the 16th and 31st of August)

Les effets d'El Niño 1983 : l'événement du siècle !!

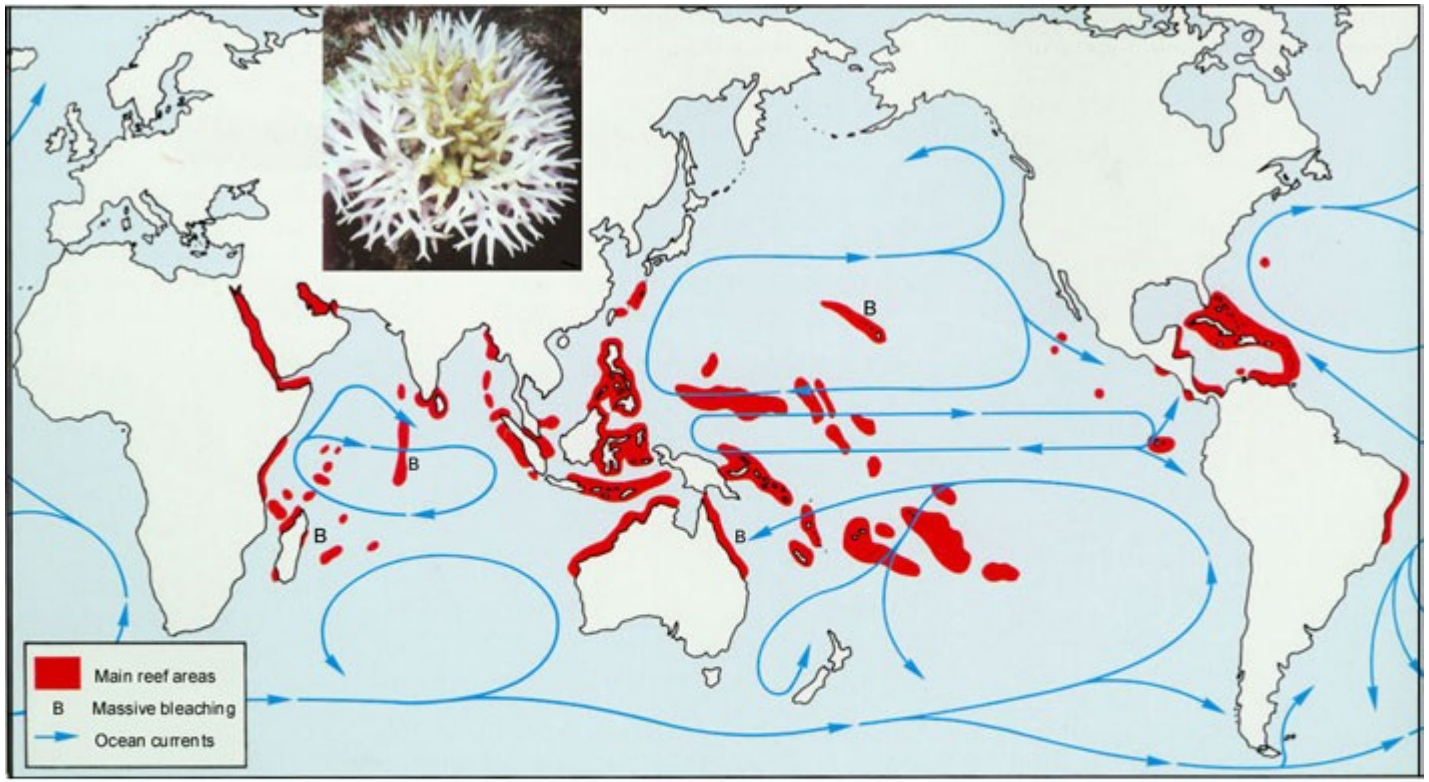
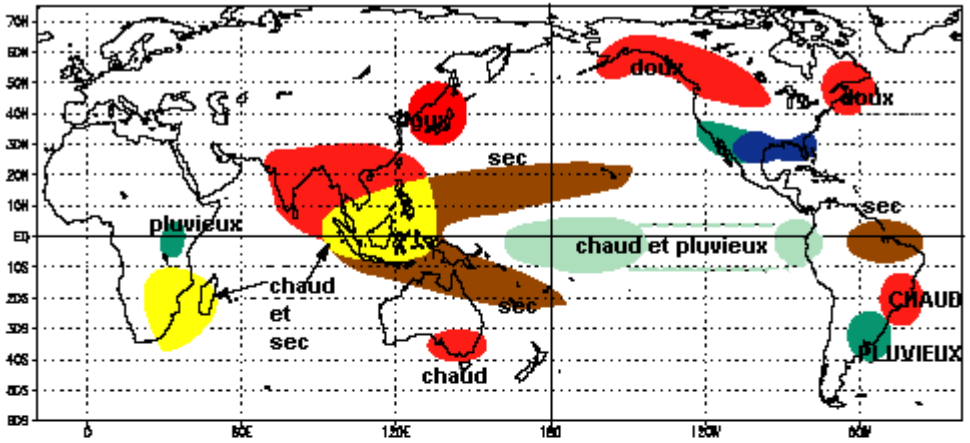


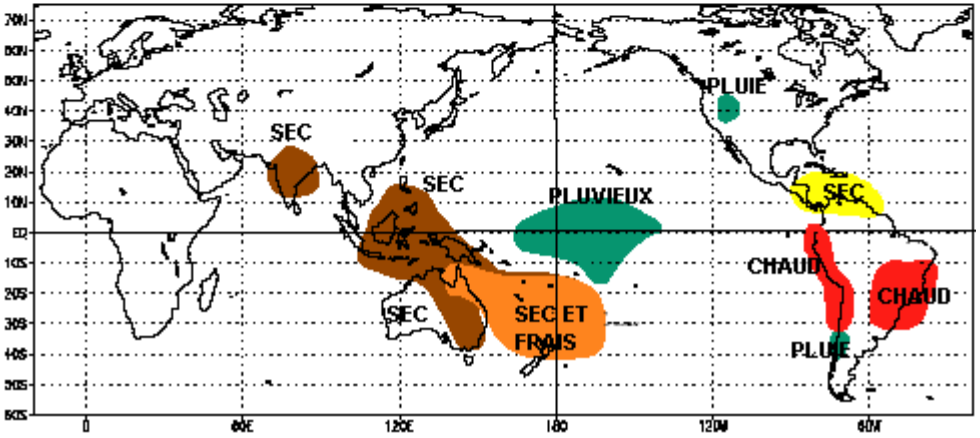
Fig.17 Coral reefs are found in warm, shallow, and clear waters of the tropical sea. Upon excessive heating, UV-radiation, and other factors, branching corals like Acroporidae (inlet) are the first to bleach. Bleaching is characterized by the expulsion of the dinoflagellated (zooxanthellae) from the coral tissue. Branching corals may regrow within a few years, while boulder corals may take several 100 years to reach the original size.

Et sur le reste du monde ?

DÉCEMBRE À FÉVRIER



JUIN À AOÛT



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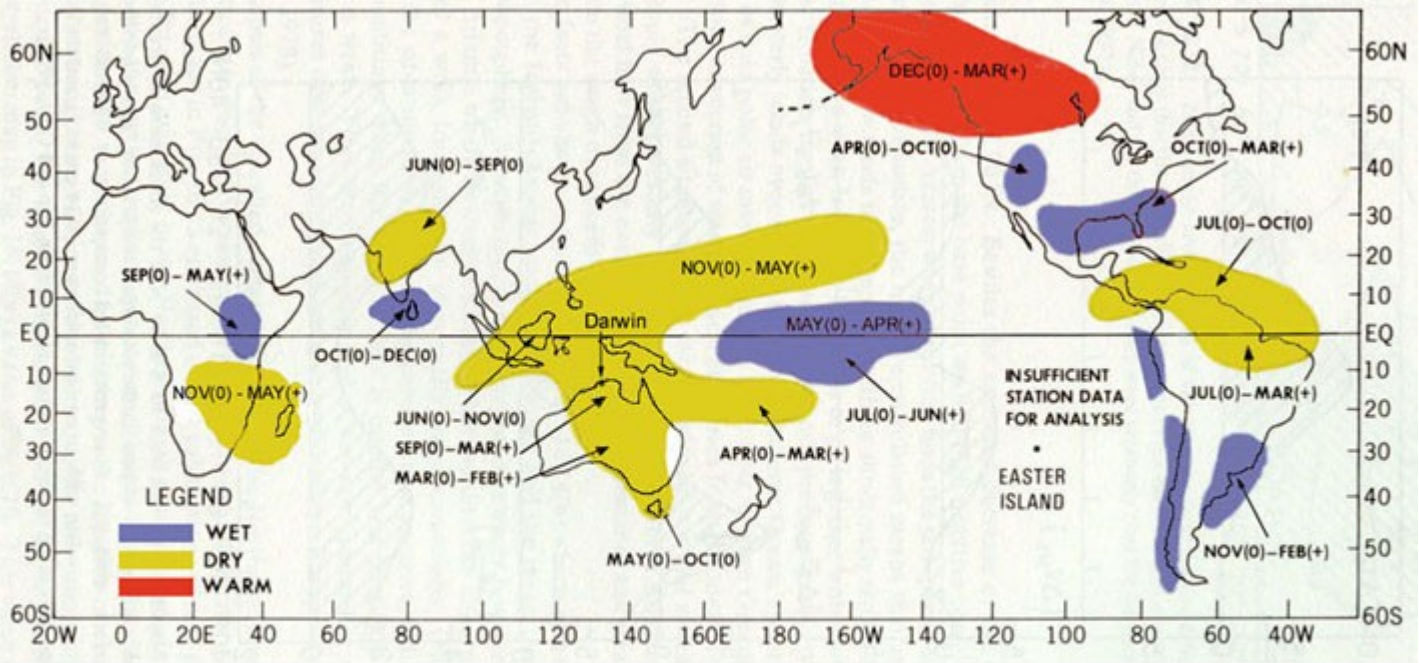

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Merci pour votre attention

Ce n’est pas fini, plus d’infos sur l’association :
www.avenirclimatique.org

Quelques sources pour approfondir

- http://www.ncdc.noaa.gov/sotc/global/2013/11
- http://23dd.fr/climat/les-climatosceptiques/23-les-temperatures-baissent-dep
- http://iopscience.iop.org/1748-9326/6/4/044022/pdf/1748-9326_6_4_044022
- http://www.canal-u.tv/video/universite_de_tous_les_savoirs/le_phenomene_
- http://fr.wikipedia.org/wiki/El_Ni%C3%B1o
- http://www.notre-planete.info/terre/climatologie_meteo/elnino.php
- http://www2.ggl.ulaval.ca/personnel/bourque/s3/el.nino.html
- http://www.meteo.org/phenomen/el-nino.htm
- http://www.aoml.noaa.gov/general/enso_faq/
- http://www.zetatalk3.com/theword/tword14d.htm
- http://biophysics.sbg.ac.at/atmo/elnino.htm